

# **KNOW, UNDERSTAND, DO (KUD) CHART GUIDE SHEET**

**SUBJECT: Science**

**TIME FRAME: 9 Days**

**UNIT #1: What is Science? (Important)**

**GRADE: 6**

<b>KNOW</b>	<b>UNDERSTAND</b>	<b>DO</b>
Facts, formulas, vocabulary	Concepts, principles, generalizations, big ideas, enduring learning	Skills
<p>Vocabulary: scientific method, observing, predicting, inferring, fact, theory, law, earth science, life science, physical science, stereotype, quantitative observation, qualitative observation</p> <p>Characteristics and stereotypes of scientists</p> <p>Facts, theories, laws</p> <p>Branches of science-earth, life, physical</p> <p>Examples of sciences within each branch</p> <p>Positive &amp; negative influences of technology &amp; science of Earth</p>	<p>Science helps us understand questions and solve problems.</p>	<p>Illustrate a scientist to demonstrate characteristics vs. stereotypes.</p> <p>Distinguish between scientific theory and opinion.</p> <p>Classify various disciplines of science into three branches. (Thinking Skill – classifying)</p> <p>Evaluate positive and negative impact of technology on society. (Informational writing)</p>

# **KNOW, UNDERSTAND, DO (KUD) CHART GUIDE SHEET**

**SUBJECT: Science**

**TIME FRAME: 17 Days**

**UNIT #2: Metric Measurement (Important)**

**GRADE: 6**

<b>KNOW</b>	<b>UNDERSTAND</b>	<b>DO</b>
Facts, formulas, vocabulary	Concepts, principles, generalizations, big ideas, enduring learning	Skills
<p>Vocabulary: meter, millimeter, centimeter, kilometer, light year, gram, kilogram, liter, milliliter, kiloliter, cubic centimeter, volume, weight, Newton, mass, density, Celsius, SI (system of Units), meniscus, Kelvin scale, graduated cylinder, triple-beam balance</p> <p>Base units: meter, liter, gram</p> <p>Metric prefixes: milli-, centi-, kilo-</p> <p>Metric tools &amp; use: graduated cylinder, triple-beam balance, meter stick, thermometer</p> <p>Relationships or formulas:  <math>D = \text{mass} / \text{volume}</math>                      kilo = 1000                      centi = 1/100                      milli = 1/1000</p> <p>Difference between mass &amp; weight</p> <p>Base ten system</p>	<p>The metric system is the universal system of measurement in science.</p>	<p>Convert from one metric unit to another. (Thinking Skill – abstracting)</p> <p>Use appropriate tools to make metric measurements (mass, density, volume, length, temperature).</p> <p>Apply metric measurements in lab situations.</p> <p>Persuade someone that the metric system is the superior system. (Persuasive writing) (Thinking Skill – Construct/Support)</p>

# **KNOW, UNDERSTAND, DO (KUD) CHART GUIDE SHEET**

**SUBJECT: Science**

**UNIT #3: Variables (Essential)**

**TIME FRAME: 22 Days**

**GRADE: 6**

<b>KNOW</b>	<b>UNDERSTAND</b>	<b>DO</b>
Facts, formulas, vocabulary	Concepts, principles, generalizations, big ideas, enduring learning	Skills
<p>Vocabulary: variable, independent variable, dependent variable, x-axis, y-axis, concrete graph, picture graph, two-coordinate graph, bob, pendulum, cycle, standard, displacement, systems, capacity, buoyancy, control, controlled experiment</p> <p>Three types of graphs (concrete, picture and two-coordinate)</p> <p>Parts of a two-coordinate graph</p> <p>Factors that affect a pendulum, boat and FOSS plane</p>	<p>A variable is anything in an experiment that might affect the outcome.</p> <p>In a controlled experiment, scientists test one variable at a time.</p>	<p>Describe relationships between the independent and dependent variables.</p> <p>Make inferences and predictions using data from graphs.</p> <p>Identify and test variables.</p> <p>Design a controlled experiment.</p> <p>Graph and interpret data.</p> <p>Find the capacity of a container.</p> <p>Use error analysis to identify questionable results. (Thinking Skill – Error Analysis)</p> <p>Describe a controlled experiment and explain why only one variable is tested at a time. (Informational writing)</p>

# **KNOW, UNDERSTAND, DO (KUD) CHART GUIDE SHEET**

**SUBJECT: Science**

**UNIT #4: Scientific Method (Important)**

**TIME FRAME: 5 Days**

**GRADE: 6**

<b>KNOW</b>	<b>UNDERSTAND</b>	<b>DO</b>
Facts, formulas, vocabulary	Concepts, principles, generalizations, big ideas, enduring learning	Skills
<p>Vocabulary: hypothesis, conclusion, procedure, scientific inquiry, data analysis, observation, testable</p> <p>Know the steps of the scientific method (state the problem, gather information, form a hypothesis, conduct the experiment, record and analyze data, state a conclusion, repeat the work)</p>	<p>The scientific method is a sequential process used to solve problems.</p>	<p>Sequence the steps of the scientific method by using simulated experiments.</p> <p>Classify and categorize actions of scientists according to the steps of the scientific method. (Thinking Skill – Classify)</p> <p>Voluntarily participate in a science fair by designing a project using the scientific method.</p> <p>Evaluate and analyze whether the steps of the scientific method were used appropriately in a given scenario. (Informational writing) (Thinking Skill – Error Analysis)</p>

# **KNOW, UNDERSTAND, DO (KUD) CHART GUIDE SHEET**

**SUBJECT: Science**  
**UNIT #5: Space (Compact)**

**TIME FRAME: 10 Days**  
**GRADE: 6**

<b>KNOW</b>	<b>UNDERSTAND</b>	<b>DO</b>
Facts, formulas, vocabulary	Concepts, principles, generalizations, big ideas, enduring learning	Skills
<p>Vocabulary: model, natural system, rotation, revolution, asteroid, meteor, meteorite, meteoroid, orbit, planet, satellite, celestial</p> <p>Name of planets</p> <p>Role of gravity in the universe</p> <p>How revolution and rotation affect Earth</p> <p>Technology advances our understanding of space and the solar system.</p>	<p>The Earth is a member of a natural system called the solar system.</p>	<p>Select and research one aspect of the solar system.</p> <p>Create a presentation using information about the solar system.</p> <p>Compare and contrast characteristics of celestial bodies of the solar system. (Thinking Skill – Compare/Contrast)</p> <p>Describe the positive and negative, intended and unintended, effects of specific technological developments in space exploration. (Narrative or informational writing)</p>

# **KNOW, UNDERSTAND, DO (KUD) CHART GUIDE SHEET**

**SUBJECT: Science**

**UNIT #6: Changing Earth (Essential)**

**TIME FRAME: 38 Days**

**GRADE: 6**

<b>KNOW</b>	<b>UNDERSTAND</b>	<b>DO</b>
Facts, formulas, vocabulary	Concepts, principles, generalizations, big ideas, enduring learning	Skills
<p>Vocabulary: structure, core, mantle, stress, compression, deformation, tension, shearing, fracture, fault, hanging wall, foot wall, normal fault, reverse fault, strike-slip fault, thrust fault, fault-block mountain, rift valley, fold, anticline, syncline, dome, magma, vent, volcanic dust, volcanic ash, volcanic bomb, cinders, cinder cone volcano, shield volcano, composite/strata-volcano, caldera, mid-ocean ridge, plate tectonics, trench, subduction, tsunamis, epicenter, focus, seismic waves, seismograph, seismologist, Richter Scale, seismogram, Pangaea, plate, lithosphere, convection, convection currents</p> <p>Layers of the Earth Types of stress on Earth's crust Types of faults Parts of a fold Types of volcanoes Seismic waves Volcanic and earthquake zones Types of plate movement Geologic tools and scales Past and present geologic theories Process of sea-floor spreading Process of subduction</p>	<p>The Earth is constantly in a state of interior and exterior change.</p>	<p>Label a diagram of the layers of the Earth.</p> <p>Demonstrate the movement of faults and stresses.</p> <p>Map and predict the epicenter of an earthquake.</p> <p>Graph differences in P and S waves.</p> <p>Demonstrate the movement of seismic waves.</p> <p>Plot the occurrence of earthquakes and volcanic eruptions around the Earth.</p> <p>Create a presentation on a particular earthquake or volcano.</p> <p>Compare/contrast different processes that change the Earth's surface.</p> <p>Describe how past geologic theories impact current scientific thinking. (Informational writing) (Thinking Skill – deductive reasoning)</p>

# **KNOW, UNDERSTAND, DO (KUD) CHART GUIDE SHEET**

**SUBJECT: Science**  
**UNIT #7: Levers (Essential)**

**TIME FRAME: 10 Days**

**GRADE: 6**

<b>KNOW</b>	<b>UNDERSTAND</b>	<b>DO</b>
Facts, formulas, vocabulary	Concepts, principles, generalizations, big ideas, enduring learning	Skills
<p>Vocabulary: lever, lever arm, fulcrum, advantage, load, effort, resistance, spring scale</p> <p>Classes of levers</p> <p>Parts of a lever system</p> <p>Real life examples of levers</p> <p>Effort is the force needed to move a load or overcome a resistance.</p> <p>Load is the mass lifted or a resistance overcome by a lever.</p> <p>Advantages of using levers</p> <p>“F-L-E (Force – Load – Effort) 1-2-3” (class 1, class 2, class 3)</p>	<p>A lever is a type of simple machine that uses a pivot point to make work easier.</p>	<p>Explain the parts of a lever system and how they work together to give us an advantage.</p> <p>Construct different lever systems and measure the effort.</p> <p>Analyze data to determine the most advantageous lever system. (Thinking Skill – inductive reasoning)</p> <p>Graph the results of lever experiments and use the results to state relationships between the variables. (effort/load, position of effort/load)</p> <p>Diagram 3 classes of levers and real-world levers.</p> <p>Use a spring scale to determine the amount of effort needed to lift a load.</p> <p>Evaluate lever systems, determine which is most effective, and explain your reasoning. (Informational writing)</p>

# **KNOW, UNDERSTAND, DO (KUD) CHART GUIDE SHEET**

**SUBJECT: Science**  
**UNIT #8: Pulley's (Essential)**

**TIME FRAME: 10 Days**

**GRADE: 6**

<b>KNOW</b>	<b>UNDERSTAND</b>	<b>DO</b>
Facts, formulas, vocabulary	Concepts, principles, generalizations, big ideas, enduring learning	Skills
<p>Vocabulary: Single-fixed, single-movable, mechanical advantage, directional advantage, single-fixed/single-movable (effort up or effort down)</p> <p>Parts of a pulley system</p> <p>Types of pulley systems</p> <p>Real-life examples and uses of pulleys</p> <p>Relationship between the number of supporting ropes and the advantage</p>	<p>A pulley is type of simple machine that uses a rimmed wheel and rope to make work easier.</p>	<p>Explain the parts of a pulley system and how they work together to give us an advantage.</p> <p>Construct different pulley systems and measure the effort.</p> <p>Analyze data to determine the most advantageous pulley system. (Thinking Skill – inductive reasoning)</p> <p>Diagram pulley systems to show relationships between variables (number of supporting ropes and wheels).</p> <p>Use a spring scale to determine the amount of effort needed to lift a load.</p> <p>Evaluate pulley systems, determine which is most effective, and explain your reasoning. (Informational writing)</p>



# **KNOW, UNDERSTAND, DO (KUD) CHART GUIDE SHEET**

**SUBJECT: Science**  
**UNIT #9: Weather (Essential)**

**TIME FRAME: 30 Days**  
**GRADE: 6**

<b>KNOW</b>	<b>UNDERSTAND</b>	<b>DO</b>
Facts, formulas, vocabulary	Concepts, principles, generalizations, big ideas, enduring learning	Skills
<p>Vocabulary: heat energy, convection, conduction, radiation, winds (local, global, monsoon), air pressure, ultraviolet &amp; infrared rays, relative humidity, ozone layer, greenhouse effect, meteorology, front, jet stream, sea &amp; land breeze, doldrums, horse latitudes, trade/easterly/westerly winds, cumulus/cirrus/stratus clouds, weather vane, barometer (mercury and aneroid), psychrometer, anemometer, lake effect snow</p> <p>Four atmospheric factors</p> <p>Instruments that measure four factors</p> <p>Types of heat transfer</p> <p>Basic cloud types</p> <p>Factors that affect air pressure</p> <p>Local and global wind patterns</p> <p>Types of storms</p> <p>Impact of greenhouse effect and ozone layer</p>	<p>Earth's weather is caused by the interaction of heat energy, air pressure, winds, and moisture in the atmosphere.</p>	<p>Diagram the greenhouse effect.</p> <p>Demonstrate how the angle of the sun's rays affects the Earth's temperature.</p> <p>Use a thermometer to measure temperature.</p> <p>Describe how the three factors affect air pressure.</p> <p>Classify and diagram local and global wind patterns.</p> <p>Compare and contrast basic cloud types.</p> <p>Explain how extreme weather events affect our lives. (Informational writing)</p> <p>Create a graphic organizer to show how the four atmospheric factors cause our weather. (Thinking Skill – cause/effect)</p>

# **KNOW, UNDERSTAND, DO (KUD) CHART GUIDE SHEET**

**SUBJECT: Science**

**UNIT #10: Environmental (Compact)**

**TIME FRAME: 6 Days**

**GRADE: 6**

<b>KNOW</b>	<b>UNDERSTAND</b>	<b>DO</b>
Facts, formulas, vocabulary	Concepts, principles, generalizations, big ideas, enduring learning	Skills
<p>Vocabulary: fossil fuels, biomass fuels, renewability, wind generator, geothermal energy, solar energy, nuclear energy, hydroelectric energy</p> <p>Needs for fuel use</p> <p>Types of fuel</p> <p>Bi-products of various fuels</p> <p>Ways to conserve fuels</p>	<p>Mankind's need for energy causes us to continually look for new sources and ways to conserve.</p>	<p>Compare and contrast various energy sources.</p> <p>Evaluate the use of various energy sources.</p> <p>Identify local and regional sources of energy.</p> <p>Compile a list of ways to conserve energy in your home or community.</p> <p>Compose a persuasive letter to a government official encouraging implementation of conservation measures. (Persuasive writing) (Thinking Skill – Analyzing perspective)</p>